

## 7 success factors for efficient sheet metal fabrication

**Nowadays, sheet metal fabricators have to be able to adapt their processes to the specific jobs while simultaneously complying with even shorter delivery times. Utilizing state-of-the-art machine technology is one response to this challenge. However, what is the point of using fast machines when there are problems with the process chain? Find out which seven success factors help to ensure efficient sheet metal fabrication.**

### Success factor 1: Automated warehouses accelerate the logistics

Laser job shops often have to adapt their processes to new jobs on a daily basis. The ability to rapidly access the material is an advantage here. Automated warehouses provide various materials at the push of a button. A warehousing system delivers the requested material directly to the laser cutting system and then transports the cut parts and unused material back again. Directly connecting the automated warehouse to the machinery saves up to 70% of the time needed. In turn, the ability to provide the material far more rapidly also ensures significantly higher use of the machine capacities. The autonomous processing from the warehouse to the cut part has now been implemented for a number of applications.

### Success factor 2: Save on leveling costs with an in-house leveler

Internal stresses in the material do not become apparent until later on during the manufacturing process. Some suppliers avoid the problem by purchasing panels largely free of internal stresses. However, purchasing the “cream of the crop” is a relatively expensive approach. In contrast, acquiring a leveler enables companies to obtain less expensive materials from a broader range of suppliers. This material is then leveled in-house. Modern roller levelers utilize an offset roller layout to repeatedly bend the material until the internal stresses in have been eliminated.

## Success factor 3: Deburring machines eliminate residues

Most suppliers have integrated deburring machines into their process chain in response to the demand for cleanly deburred parts. In addition, machine deburring has proven to be a key aspect of efficient sheet metal fabrication. Removing the sharp edges from the parts reduces the risk of injury to your employees and simplifies handling the material as a benefit. Furthermore, materials with burrs can cause problems during downstream processing. Laser burrs or sharp edges can also damage tools and machinery during the subsequent processes. Materials without burrs are therefore easier to assemble or fit into welding fixtures.

## Success factor 4: Levelers ensure perfect bending results

Many laser job shops are not aware of the fact that leveled panels contribute significantly to enhance the efficiency of sheet metal fabrication. The more the sheet metal has been processed, the more difficult it is to rectify material faults later on. That is why leveling the material initially is a major advantage. During laser cutting, parts of un-leveled sheets can warp and damage the laser head. Additionally, when shaping the sheet metal after the cutting process, internal stresses can have a negative impact on the reliability of the bending process. Once the robot begins to feed the panels into the press brake and the operator can no longer easily carry out corrections during the bending process, flat sheet metal parts with minimal internal stresses show their worth. Leveled panels help to ensure highly reliable bending.

## Success factor 5: “Stress-free panels” for successful welding

Customers continue to see more precise quality requirements for their raw sheet metal parts. These also include tighter tolerances. Under some circumstances, an un-leveled part may fail to fulfill the customer’s tolerance specifications. If un-leveled parts are welded together to form assemblies, the product may exceed the tolerances and require extensive reworking. Bent panels can also cause time-consuming problems with the welding process itself. These begin with the welding preparation when fitting the panels into the welding fixture proves to be time-consuming. During welding, the bent panels can also cause problems, especially with robotic welding: the deformed workpieces may not fit together precisely. Consequently, welding robots require an accurate welding gap to deliver reliable results. The use of levelers drastically reduces the welding preparation times and enormously enhances the reliability of the overall welding process.

## Success factor 6: Less milling thanks to prior leveling

Flatness requirements in the micrometer range are not an uncommon requirement from customers in the machine building industry. In response to this, many suppliers have integrated grinding or milling machines into their process chain. Milling is capable of removing even the smallest unevenness from the panels. Leveling the part beforehand, results in significantly less milling work. Furthermore, leveled parts are easier to clamp into the fixture of a milling machine. Therefore, assessing the positive effects of leveling before milling is worthwhile.

## Success factor 7: Rounded edges for reliable coatings

When paint or powder coatings begin to flake off the sharp edges of your assemblies, complaints are bound to follow. Rounded edges on the parts tremendously improve the adhesion of the paint and other coatings. This is why rounding the edges is an important step after laser cutting. Although edge-rounding represents an additional process near the beginning of the processing chain, it prevents unpleasant surprises further down the line. Nowadays, deburring machines reliably deburr and round the panel edges in a single pass. High-speed grinding tools rapidly round the edges of the panel, delivering consistent quality. One appealing side-effect: this processing step often creates an attractive surface finish on the panel.

## Overview: Intelligent linkage of the process steps

Deburring and leveling can now be largely automated. However, the diverse spectrum of jobs complicates the suppliers' processes. As such, effectively linking the individual machine elements to create a smooth and uninterrupted chain is the ideal means of achieving efficient sheet metal processing. ARKU has developed a connected system which combines leveling and deburring machines. The sheet metal part only has to be placed on a conveyor and the parts are then run through the machines. If desired, robots can handle the part feeding and removal enabling the implementation of highly automated processes for many applications.